

The opinion in support of the decision being entered today was *not* written for publication and is not binding precedent of the Board.

Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* BORIS SOROKOV  
and  
ILYA KHANUKOV

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Appeal No. 1999-0908  
Application No. 08/388,425

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HEARD: OCTOBER 11, 2001

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Before PAK, WARREN, and OWENS, *Administrative Patent Judges*.  
PAK, *Administrative Patent Judge*.

*DECISION ON APPEAL*

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 1, 2, 4, 5, 21, 23 through 25 and 27 through 31, which are all of the claims pending in the above-identified application.

Claim 1 is representative of the subject matter on appeal and reads as follows:

1. A method of depositing a coating onto a substrate by means of a sputtering process, wherein a flow discharge plasma is generated in a diode sputtering source between a cathode, provided with an outwardly facing surface constituting a target, and an anode, and wherein generation of said plasma results in ion bombardment of said target followed by ejection of target material and movement of said target material toward said substrate with subsequent formation of a coating deposited onto said substrate;

said method comprising the steps of:

- i) introducing a substrate into a process chamber so as to expose a surface of said substrate to flux of the sputtered target material;
- ii) establishing a magnetic field within said chamber;
- iii) applying, to said cathode, electrical power sufficient for establishing a glow discharge;
- iv) establishing, within said chamber, an atmosphere of ionizable fluid continuously fed thereinto and evacuated therefrom so as to establish a uniform working pressure within said chamber; and
- v) maintaining, between said anode and said cathode, a self-sustained glow discharge accompanied by generation of a plasma consisting of ions of an ionizable fluid for bombarding said target and emitting target material toward said substrate;

wherein said diode sputtering source is a high voltage discharge diode source with an applied arbitrary, directed, stationary magnetic field, and wherein said field is varied in such a manner that there is established a gradient of magnetic field strength

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directed from said anode to said target, and wherein the magnetic strength of said magnetic field within a first region situated adjacent to said anode exceeds a magnetic field strength within a second region situated adjacent to said target by at least 25%, and said

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second region has a configuration of a layer, said layer extending above and along said outwardly facing target surface, and wherein said magnetic field is configured so as to localize and shift said plasma away from said substrate.

In support of his rejections, the examiner relies on the following prior art references:

Knowles et al. (Knowles)	3,669,860
Jun. 13, 1972	
Boucher et al. (Boucher)	4,094,764
Jun. 13, 1978	

Claims 1, 2, 4, 5, 21, 23 through 25 and 27 through 31 stand rejected under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Boucher and Knowles.

We reverse the aforementioned § 103 rejection for essentially those reasons expressed in the Brief. We only add that neither Boucher nor Knowles alone, or in combination, would have suggested using the claimed gradient of magnetic field strength directed from an anode to a target, wherein "the magnetic strength of said magnetic field within a first region situated adjacent to said anode exceeds a magnetic field strength within a second region situated adjacent to said target by at least 25% . . . ." As correctly pointed out by appellants, both Boucher and Knowles do not teach or

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suggest the importance of varying the magnetic field gradient,  
much less varying it in the claimed manner, i.e., providing  
specific magnetic field strengths at the particular locations  
of a sputtering coating system.

The decision of the examiner is reversed.

*REVERSED*

CHUNG K. PAK	)	
Administrative Patent Judge	)	
	)	
	)	
	)	BOARD OF PATENT
CHARLES F. WARREN	)	APPEALS AND
Administrative Patent Judge	)	INTERFERENCES
	)	
	)	
	)	
TERRY J. OWENS	)	
Administrative Patent Judge	)	

CKP:hh

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